J O I N T C E N T E R
AEI-BROOKINGS JOINT CENTER FOR REGULATORY STUDIES

Government Failure in Urban Transportation

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Working Paper 00-8

November 2000

Clifford Winston is a fellow at the AEI-Brookings Joint Center for Regulatory Studies and a senior fellow at the Brookings Institution. The author gratefully acknowledges the assistance of Alise Upitis and the comments of Kenneth Button, John Meyer, Steven Morrison, Don Pickrell, Chad Shirley, Kenneth Small and seminar participants at the Institute for Fiscal Studies. The views expressed in this paper reflect those of the author and do not necessarily reflect those of the institutions with which he is affiliated.

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Executive Summary

This paper assesses governmental performance in its investment, provision, and regulation of urban transportation. Attention is given to public bus and rail transit and road transportation. Evidence based on urban transport in U.S. cities reveals substantial allocative and technical inefficiencies that have led to large public transit deficits and severe highway congestion.

I argue that it is futile to expect public officials to remedy the situation by pursuing more efficient policies, such as congestion pricing and weighing costs and benefits when deciding transit service. The problem is that urban transportation policy is largely shaped by entrenched political forces that inhibit constructive change. The only realistic way to improve the system is to shield it from those influences and expose it to market forces by privatizing it. This position is supported by empirical evidence based on simulations for the United States and the United Kingdom's early experience with privatization.

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Introduction

Public provision of urban transportation is, in theory, socially desirable. Rail and bus operations exhibit economies of traffic density that could lead to destructive competition in an unregulated market. Highways are traditionally perceived as public goods that require enormous capital and maintenance investments that the private sector is unlikely to finance. Improving the urban mobility of elderly and low-income citizens is an important social goal that should be addressed by government. But in their official capacity as regulators, service providers, and investors, public officials have generally instituted policies that have led to inefficient and inequitable urban transportation. A case for privatizing urban transport is developing because these actual *government failures* most likely outweigh potential *market failures*.

Governmental involvement in the transportation systems of U.S. cities illustrates the problem. Local governments, with state and federal financial support, are quasi-monopoly providers of urban bus and rail transit. Most U.S. roads and bridges are owned and operated by federal, state, or local governments. How has the public system performed? City roads are jammed at an ever expanding rush hour, causing infuriating delays. Bus service, never fast, has deteriorated over the years, while fares have risen. Pressures to expand rail service to outlying suburbs remains strong, even though current rail operations cannot attract enough riders to cover more than a small fraction of their total expenses including capital costs.

Popular opinion seems to be that the United States can—and should—spend its way out of this mess by building more roads, running more buses, and installing more track. Indeed, in the Transportation Equity Act for the 21st Century, T21 for short, Congress greatly increased federal support for transit and highways for 1998-2003. Many transportation analysts are skeptical and argue that although more public spending for urban transport may result in some improvements for travelers, its primary effects will be

to swell transportation deficits and waste tax revenues. Instead, they suggest that government pursue more "efficient" policies such as charging motorists for the congestion they cause and balancing costs and benefits when deciding transit frequencies, route coverage, and vehicle sizes.

I have come to believe that it is futile to expect public officials to consider such changes because urban transportation policy is largely shaped by entrenched political forces. The forces that have led to inefficient prices and service, excessive labor costs, bloated bureaucracies, and construction-cost overruns promise more of the same for the future. The only realistic way to improve the system is to shield it from those influences and expose it to market forces by privatizing it. Preliminary evidence from the United Kingdom and elsewhere suggests that although a private urban transportation sector should not be expected to perform flawlessly, it could eliminate most government failures and allow innovation and state-of-the-art technology to flourish free of government interference. The real uncertainty is what could spur policymakers to initiate change.

The Evolution of the U.S. Urban Transit System

The U.S. government began subsidizing urban transportation in the 1950s, funding urban extensions of the interstate highway system. Then, in response both to the deteriorating financial condition of private transit—an issue to which I will return—and to arguments by big-city mayors that subsidizing transit would be more cost-effective than building highways, Congress passed legislation in the early 1960s that helped cities buy their transit companies. Federal operating subsidies followed in the 1970s. Today, most operating assistance comes from state and local governments while Washington shoulders most capital investment.

Growing federal support of mass transit slowed the long-run decline in the use of buses and light rail systems—trolleys and streetcars (figure 1). By the late 1970s, federal subsidies had expanded bus and heavy rail capacity.[1] Capacity has continued to increase

[1] It would be preferable to measure bus and rail capacity in terms of seat miles instead of vehicles miles. Information on seat miles, however, is only available from the American Public Transit Association since 1980. Based on these data, bus and heavy rail seating capacity has remained relatively constant, while light rail's seating capacity has increased somewhat. Thus, using vehicle miles instead of seat miles understates the recent growth of light rail capacity but does not have much impact on the growth of bus and heavy rail capacity.

in the past two decades, but other trends have revealed ominous weaknesses in service (Winston and Shirley (1998)). Many cities have cut bus frequency on their core routes to extend service to the suburbs. Many others, including New York, Chicago, and San Francisco, have cut rail-service frequency and raised real fares. Indeed, since 1980 real transit fares per passenger-mile have increased 54 percent.[2] Although federal support of public transit was intended to lure urban travelers from their cars, the share of commuters who use bus and rail has diminished since the 1960s. Rising incomes and suburban sprawl have reinforced commuters' preferences for their automobiles, causing autos' share of work trips to climb to nearly 84 percent by 1990 (table 1).[3] Between 1960 and 1990 mass transit's share of *all* trips in large urban areas, where transit service should be most attractive, fell from more than 20 percent to less than 10 percent.[4] And transit's high share of empty seats attests to its inefficient operations. In the mid-1990s rail filled roughly 18 percent of its seats with paying customers, buses roughly 14 percent (Winston and Shirley (1998)).

Public transit's long-run growth in capacity and decline in patronage have helped create deficits that are a serious drain on the public purse. By 1997, transit operating expenses in the United States were about $19 billion a year, almost twice the yearly $10.6 billion in operating revenues. Continuing capital investments are swelling this deficit (1998 capital subsidies amounted to $7.4 billion).[5] And government involvement portends better things for special interests than for travelers. According to Don Pickrell (1985) and Douglass B. Lee (1987), as much as 75 percent of Federal spending on mass transit ends up in the pockets of transit workers (as above-market wages) or goes to suppliers of transit capital equipment (as higher profits and interest). Just 25 percent is used to improve transit and lower fares.

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[2] American Public Transit Association, *Transit Fact Book* (various issues).

[3] These mode shares are based on decennial censuses. Mode shares based on the 2000 census are not yet available.

[4] Passenger counts and mode shares for all types of trips are available from the U.S. Federal Highway Administration, *Personal Transportation Survey* (Department of Transportation, 1990). Because the sample sizes are generally considered small, national estimates derived from these data should be regarded as preliminary. Nonetheless, the data reveal trends and magnitudes that are consistent with those based on reliable samples of work trips.

[5] Operating subsidies are from the American Public Transit Association, *1998 Transit Fact Book*, Washington DC, and capital subsidies are from the National Transit Administration, *National Transit Database*, U.S. Department of Transportation.

Although transit use has increased during the current U.S. economic expansion, transit's market share has kept falling.[6] Moreover, according to data from the National Transit Database, transit use was lower in 1998 than in 1989. Nonetheless, with growing government support for transit, cities will find it easier to build new (light) rail systems or extend existing ones, ensuring that transit deficits will grow even larger.

A fundamental problem with rail construction projects is that ridership tends to be grossly overestimated at the planning stage, while capital and operating costs are underestimated. For example, after breaking ground in 1986, the new Los Angeles Red Line (light rail system) finally opened in June 2000. The 17.4 mile system, costing more than $4.5 billion, now hopes to lure only 100,000 riders a day in a county with 10 million residents.[7] The system was originally intended to be much larger and carry more passengers, but after years of construction delays and cost overruns and faced with cost projections of some $75 billion over the next 20 years, L.A. voters decided in 1998 to block further use of local sales tax revenue for subway construction, effectively preventing expansion of the current Red Line.

Public transit authorities face growing financial pressures to maintain rail operations as these systems age. For example, the Washington, D.C., Metro subway system, which began service only in 1976, is struggling with equipment breakdowns, such as broken escalators and failed relays, and water seepage that is crippling power and communications systems and track infrastructure at an alarming rate. When faced with the likelihood that money would not be available over the next several years to make all necessary repairs and purchase additional equipment, regional planners concluded that far more people will have to drive cars than previously projected.[8]

In retrospect, the U.S. public transportation experiment has been a major disappointment and done little to stem the growth of automobile travel. Policymakers are now confronted with the rising costs of this experiment.

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[6] Wendell Cox, "Report of Public Transit's 'Record' Ridership Questionable," June 2000 (available at www.heritage.org).
[7] Todd S. Purdum, "Los Angeles Subway Reaches End of the Line," *New York Times*, June 23, 2000, p. 1.
[8] Alan Sipress, "Transportation Plan Reveals Funding Gap," *Washington Post*, July 13, 2000, p. 1.

U.S. Urban Highways

The United States has invested hundreds of billions of dollars—primarily from gas taxes—in building and maintaining roads to accommodate auto and truck travel, but like rail transit investments, the cost of some urban road projects has turned out to be much greater than anticipated. The most glaring example of cost overruns is the so-called Big Dig depression of Boston's central artery, considered to be the largest public works project in U.S. history. Originally projected to cost $2.3 billion in 1984, it is now expected to cost $13.6 billion when finally completed in 2004, but even that figure could rise.[9] At a smaller scale, but indicative of the extent of the problem, transportation officials in the Washington, D.C., region acknowledge that the cost of replacing a major highway interchange known as the "Mixing Bowl" has ballooned from $350 million to $509 million and become the region's most expensive highway project. Officials fear costs could run higher and stall other transportation projects.[10]

The motoring public is less knowledgeable about construction cost overruns than about the increase in urban automobile congestion. Vehicle-miles traveled in urban areas increased 82 percent from 1980 to 1997, while urban road mileage increased only 33 percent.[11] The share of urban highways with peak-hour traffic volume exceeding 71 percent of design capacity, a common indicator of congestion, increased steadily during the 1980s to more than 50 percent of urban interstate miles and 40 percent of other freeway miles (figure 2).[12] Although workplace and residential adjustments during the 1990s, such as working and living in outlying suburbs, have helped stabilize urban congestion, the current annual costs to travelers, mainly in the form of wasted time but also extra consumption of gasoline and vehicle wear and tear, have been estimated to run as high as $40 billion. And the annual cost of congestion to shippers, in the form of higher inventories and more goods stuck enroute, adds considerably to this figure.[13]

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[9] Pamela Ferdinand, "Boston's 'Big Dig' Buried in Cost Overruns," *Washington Post*, April 12, 2000, p. A3.
[10] Alan Sipress, "Springfield Interchange Price Tag Rises 45%," *Washington Post*, June 15, 2000, p. B1.
[11] U. S. Federal Highway Administration, *Highway Statistics*, various years.
[12] Measures of congestion after 1994 are based on a change in capacity calculation procedures, which makes it difficult to compare congestion in 1995 and years thereafter with previous years.
[13] Estimates of the costs of automobile congestion to travelers are produced by the Texas Transportation Institute at Texas A&M University.

Even when roads are widened to keep up with demand, the expanded roads shortly fill to capacity. For example, the Montgomery County, Maryland, transportation director pressed the Maryland state government to widen its Interstate 270 six years ahead of schedule to accommodate growing traffic. Maryland responded with $200 million to widen more than a dozen miles of I-270, up to 12 lanes in some stretches. But less than eight years after the project was finished, county officials describe the highway as "a rolling parking lot."[14]

The U.S. road system represents the nation's largest civilian public investment. Nonetheless, congestion appears to have become an intractable problem because public expenditures to expand urban road capacity cannot keep up with growing automobile travel.

Economic Inefficiencies of Current Urban Transport Policy

The traditional theoretical justification for government management and operation of transit is that a private transit market would result in destructive competition.[15] Public transit agencies could maximize social net-benefits by setting travelers' fares equal to the marginal cost of their trips and providing service, such as frequency and route coverage, where additional benefits to travelers equal the additional costs.[16] Government ownership and management of roads is justified on the grounds that roads are (for the most part) public goods that require enormous investments. Given congestion and pavement wear, the public highway authority could maximize social net-benefits by charging users for the particular costs they incur and by making investments where marginal benefits equal marginal costs.

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[14] This is partly an outcome of Downs's (1962) law: On urban commuter expressways, peak-hour traffic congestion rises to meet maximum capacity, because commuters shift from less preferred modes and times of day.

[15] Government intervention has also been justified on the grounds of "Hotelling" bunching—competing transit companies would arrive at bus stops or rail stations at the same time. Bunching, however, occurs quite frequently in most public transit systems.

[16] If transit companies operate where there are increasing returns to scale, this first-best policy will require some subsidy because marginal costs are below average costs. If no subsidies are available (an unlikely situation in public transit), then Ramsey pricing represents the efficient second-best policy where the percentage mark-up of fares above marginal cost is inversely related to travelers' demand elasticities subject to a breakeven constraint.

Large public transit deficits, low transit load factors, and severe highway congestion, however, suggest that the U.S. public sector is not setting urban transportation prices and service to maximize net benefits. Winston and Shirley (1998) explore this matter empirically by estimating the net benefits from two policies:

replacing current transit prices and service frequency with marginal cost transit fares and optimal service frequency and setting marginal cost automobile congestion tolls.[17] (The tolls, which can be assessed with current technology that does not disrupt motorists' journeys or invade their privacy, account for travelers' value of time and vary with the level of congestion throughout the day.) Policy simulations are based on an equilibrium model of urban transportation pricing and service where urban commuters choose among alternative modes (auto, bus, rail, taxi, or carpool) and departure times. The effects of the pricing and service policies on consumer benefits and government balances are shown in table 2.[18]

The net benefits from implementing only the pricing components of this policy total nearly $8 billion a year. Because optimal pricing means much higher fares and tolls, travelers themselves lose $16 billion.[19] But these private losses are more than offset by the reduced public transit deficits and accumulated toll revenues that bring the urban transportation budget into balance. It is, of course, questionable whether the average citizen will see benefits in policies that increase his costs, even as they lower public deficits. But voters are demonstrably inclined to support elected officials who reduce government spending (Peltzman (1992), Winston and Crandall (1994)), so travelers wearing their hats as taxpayers would likely vote for their enlightened self-interest at the ballot box. In fact, the benefits noted in table 2 are understated because they do not account for the cost of raising public funds (excess burden) to cover the transit deficit.

[17] Optimal transit frequency is the level of bus and rail frequency that maximizes net benefits, which are composed of the changes in travelers' benefits, congestion toll revenues, bus revenues and costs, and rail revenues and costs.

[18] Consumer benefits are measured by compensating variations that are based on the joint choice model of mode and departure time. Changes in government balances are based on changes in bus revenues and costs, rail revenues and costs, and toll revenues.

[19] Congestion pricing provides benefits to peak-period auto travelers in the form of shorter travel time. The losses to travelers are net of these benefits.

Some policymakers and analysts have tried to justify transit subsidies on second-best efficiency grounds because auto travel is implicitly subsidized—that is, travelers' costs of using their automobiles do not include the costs of congestion, pollution, and the like. But the findings show that overall urban transportation efficiency would improve if *any* mode's prices were aligned with its marginal costs. Current transit fares are so out of line with costs that marginal cost pricing would reduce economic waste, even if the price of using auto remained unchanged. By the same token, raising the cost of driving to account for congestion without raising mass transit fares would also increase overall urban transportation efficiency.

Net benefits to society would climb to $13 billion a year if service frequency as well as prices were adjusted to maximize net benefits. Current transit frequency is excessive because of low ridership and oversized vehicles. Thus cutting frequency generates benefits because public deficits are reduced by more than the value of service lost to urban travelers.

Government's failure to set efficient prices and service frequency for bus and rail transit and set optimal tolls for auto travel has generated large social costs, but these are only part of the allocative inefficiencies created by government involvement in urban transportation. Inefficiencies have also arisen because transit's service offerings are not optimized in other areas such as route coverage and because highway charges do not reflect the pavement damage caused by trucks.[20]

Public authorities have also failed to keep down the cost of urban transit service. The large share of empty bus and rail seats is one indication that costs are too high.[21] This excess capacity also prevents transit from realizing its competitive advantage over auto. Transit's average operating costs per *seat* mile are lower than auto's, but its empty seats

[20] Road damage depends on a truck's weight per axle (the more axles a truck has for a given load, the less pavement damage) and should be covered by a user charge per mile based on axle weight. Small, Winston, and Evans (1989) estimate that the efficiency improvements from replacing the gas tax, which is currently used to charge trucks for highway use, with an axle-weight tax amount to $8 billion (1996) dollars, using a GDP inflator. With respect to efficient pricing of other transport externalities, Winston and Shirley (1998) find there would be small net benefits from charging travelers for the cost of accidents and pollution.

[21] Transit's inherent operations—gradually increasing ridership in the primary commuting direction and consistently low ridership for the reverse commute—suggest that even an efficient transit system is unlikely to achieve average load factors that exceed 50 percent. But public transit's average load factor is far below that figure and has been declining for some time. It was 22 percent in 1975, 18 percent in 1985, and 16 percent in 1995.

drive its operating costs per *passenger* mile above auto's (Winston and Shirley (1998)). Other indications of transit inefficiency include excessive wages (the typical Washington, D.C., Metrobus driver, for example, gets paid twice as much as drivers for the handful of private bus companies in the D.C. area) and declining productivity. Charles Lave (1991) estimates that transit productivity has fallen 40 percent since the public takeover in the mid-1960s.

Travel on urban thoroughfares is also not produced at minimum cost. Gabriel Roth (1996) argues that highways make inefficient use of their capacity and actually run a substantial deficit when depreciation of highway capital is taken into account. Small, Winston, and Evans (1989) found that highway pavement is generally too thin, which raises maintenance costs. Public management of construction projects also raises costs because bureaucratic rules prevent the government from using the latest technologies, causing some investments to need upgrading shortly after completion. Project managers also specify detailed regulations that force contractors to adhere to the letter of the contract instead of seeking higher-quality, efficient alternatives. Finally, highway labor costs have been elevated by the Davis-Bacon Act, which requires that prevailing union wages must be paid on all federal construction contracts.

The legislative process also encourages waste. At the federal level, transportation bills are loaded with demonstration or "pork barrel" projects to ensure passage (the Transportation Equity Act for the 21st Century is larded with some $9 billion of pork). A notorious example is the stretch of I-99 connecting Wolfsburg and Bald Eagle, Pennsylvania. Dubbed the Bud Shuster highway after the influential local congressman, the road carries less traffic in a year than the Washington, D.C., Capital Beltway carries in three days. Nonetheless Shuster supports extending it to the tune of $400 million.

For their part, state and city officials tend to prefer urban transportation projects that entail a large federal contribution over those that could yield greater social benefits. In addition, federal legislation in 1991 may have encouraged local officials to understate the potential costs of their projects by requiring that regions craft transportation programs that included only those road and transit projects that had lined up funding. When the true, as opposed to wishful, costs of these projects have become apparent, officials have delayed other projects.

Until analysts better understand how both mass transit and auto can benefit travelers, it is premature to say whether a more efficient urban transportation system would shift travelers from mass transit to auto, or vice-versa. Given the inescapable reality that the delivery of urban transportation by the public sector is creating substantial allocative and technical inefficiencies, researchers should consider how each mode's operations would improve in a privatized environment. Unfortunately, many analysts are preoccupied with how mode shares would change if policymakers followed their advice on how to design a "better" public urban transportation system. What they fail to recognize is that current inefficiencies in the public sector are not simply an historical accident that can and will be easily corrected, but rather the predictable result of powerful political forces that are unlikely to change.

Political Forces in Urban Transportation

It is no secret that policymakers—appropriately—respond more to political forces than to market forces. Thus, the subsidies that have become a fixture in urban transit largely accrue to powerful interests—higher wages to labor, including managers, operators, and station agents, and higher profits to suppliers of transit capital. But a portion does go to keeping fares below cost and expanding service beyond what could be supported without subsidies. Winston and Shirley (1998) link much of transit's pricing and service inefficiencies with patrons' political influence: upper middle-income rail riders benefit from more frequent service and route coverage, lower- and middle-income bus riders get more frequent service, and so on. Indeed, the recent debate about where to put the Red Line and new rapid bus lines in Los Angeles was more about the strength of homeowner groups and less about where the lines best integrate with the city.[22]

Transit inefficiencies might be more easily overlooked if they redistributed income from the well-to-do to the poor. But with the average annual household income of bus commuters approaching $40,000, the average annual household income of rail commuters exceeding $50,000, and with train operators and station agents for the BART

[22] Glenn Gritzner and Katherine Perez, "Something is Missing in this Red Line Picture," *Los Angeles Times*, July 10, 2000, p.1 metro.

system in San Francisco, for example, being paid more than $40,000 a year, the poor are hardly transit's greatest beneficiaries.[23]

Highway spending also responds to strong interest groups, "pork barrel" projects being an obvious example.[24] To maintain political support for a national highway system, the allocation of funds for highway repairs appears to be based on formulas that are biased in favor of (rural) states with relatively low highway use (Johnson and Libecap (2000)). In some cases, highway construction has been slowed because neighborhoods (in Boston and San Francisco, for example) resist demolitions for expressways that will mostly serve suburban commuting to downtown.

Efforts to implement congestion pricing on public highways have also been held hostage by politics. For example, a dispute between California public agencies and the state legislature over the redistribution of toll revenues prevented a congressionally authorized congestion toll experiment from being implemented on the San Francisco Bay Bridge (Shmanske (1996)). Given the wasteful spending of transportation funds, perhaps a silver lining in the nation's failure to introduce congestion pricing is that the "pot of gold" represented by congestion toll revenues has not materialized in the public sector.

A fundamental question is how much travelers are willing to pay to save travel time by having road authorities set congestion tolls on highways. Calfee and Winston (1998) and Calfee, Winston, and Stempski (forthcoming) suggest that automobile travelers' willingness to pay is much lower than once thought and that most travelers do not appear to value travel time savings enough to benefit substantially from optimal tolls. But it is clear in certain situations that auto travelers would be willing to pay considerable sums to travel faster. For example, a solo driver who was fined $50 for using a car-pool lane on a freeway in the Washington, D.C., area viewed the fine as "not a lot of money to pay to get to work an hour earlier."[25]

Policymakers' preferred method of combating congestion has been to build more roads. Less politically expedient policies such as charging motorists efficiently for road

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[23] Winston and Shirley (1998) summarize evidence concluding that public transit programs such as reverse commuting, which are designed to give low-income people greater access to suburban jobs, have not met with much success.

[24] Evans (1994) shows that the inclusion of highway demonstration projects is important to securing passage of legislation authorizing the nation's highway and transit programs.

[25] Alan Sipress and Josh White, "Guilty, but Feeling Guilt-Free," *Washington Post*, July 16, 2000, p. A1.

use find less favor.[26] Carpool lanes have been tried in some urban areas, but it is not clear whether these increase or decrease congestion. As funds for new roads are inevitably outstripped by demand and additions to existing roads fill up quickly with traffic, many urban officials are spending hundreds of thousands of dollars on commissions to "study" ways to reduce congestion. But at least one commission concluded that political obstacles seem to put any strategy out of reach.[27]

U.S. policymakers at all levels of government have shaped an urban transportation system that benefits specific travelers and suppliers, but whose welfare costs are borne by all taxpayers. As long as transit is provided by the public sector, it is hard to see how the political forces that contribute to its current allocative and technical inefficiencies could be overcome. Efforts to improve the efficiency of public roads are also hamstrung by politics. Apparently, the federal government sees no reason to change matters because the T21 legislation indicates there will be no break with past transit or highway policy. Privatization is therefore starting to be seen in a different light and is slowly attracting interest among transportation analysts as the only realistic hope for paring the huge inefficiencies that have developed in urban transportation under public management.

Building the Case for Privatization

Privatization and deregulation could transform the U.S. urban transportation system in the same way that deregulation has transformed U.S. intercity transport. Starting in the mid-1970s, deregulation of the railroad, trucking, and airline industries gave each the incentive and ability to become more efficient, innovative, and responsive to customers, generating more than $50 billion in annual net benefits to consumers (Winston (1998)). Given deregulation's bipartisan political support, it is puzzling that privatization conjures up ideological connotations among some policymakers instead of hope that it, combined with deregulation, can solve government failures. In fact, there is ample evidence that market forces in urban transit could accomplish a great deal of what

[26] Similarly, policymakers have only addressed road damage by repairing roads. They have not pursued efficient road wear taxes that would encourage truckers to shift to trucks that do less damage to the roads.
[27] Peter Behr, "Area Leaders Hit Traffic Roadblock: Political Obstacles Hamper Solutions to Driving Woes," *Washington Post*, September 28, 1997, p.A1.

public officials have been unable or unwilling to do. A conceptual case for privatizing roads can be made, but it needs empirical analysis.

Urban Transit

It is true that the federal government got involved in urban transit during the 1960s because private transit failed. But Peter Pashigian (1976) and George Hilton (1985) provide evidence that private bus operations failed because they were weakened by government regulation. Meyer and Gomez-Ibanez (1981) point out that federal policy almost made it mandatory for cities to acquire their private transit companies instead of allowing them to raise fares to become more profitable. In response to those who claim that public transit's vehicle size and scale economies imply competition is unworkable in a private market, A. A. Walters (1982) argues that the extent of these economies indicates that public transit's operations are plagued by excess capacity. Such inefficiencies could be substantially eliminated in a private market where operators have the incentive and ability to improve their operations.

Just how would privatization and deregulation reduce transit pricing and service inefficiencies? Winston and Shirley (1998) construct a model in which existing bus and rail companies are forced to compete with each other as well as automobiles and set prices and service frequency to maximize profits. They find that the effects of such competition are remarkably similar to the effects of marginal cost transit pricing and optimal service frequency. Society's gains from eliminating transit deficits—private carriers would earn profits—would substantially exceed travelers' losses from higher fares and reduced service.

These findings, however, greatly overstate the potential losses to travelers because they do not reflect the improvements in operations, marketing, and service that could be achieved by private transit and the impact that new entrants would have on fares and service.

Deregulation of intercity transportation revealed that regulation had substantially raised carriers' costs and inhibited marketing and service innovations (Winston (1998), Morrison and Winston (1999)). Given the freedom and incentive to use the latest technologies to improve routing, scheduling, and vehicle design, private transit companies could substantially raise load factors and improve productivity. Greater

competition would put downward pressure on labor and capital costs. Such influences drove deregulated railroads', airlines' and truckers' real operating costs more than a third lower than they had been under regulation. It is likely that transit operating costs would decline similarly if bus and rail companies were privatized.[28]

Under deregulation, airlines accelerated development of hub-and-spoke route structures to increase flight frequencies, railroads introduced double stack trains and made greater use of intermodal (truck-rail) systems to improve service times, and truckers developed high-service megacarriers. Railroads and truckers also contracted with shippers for special services, such as expedited pick-up and delivery to facilitate just-in-time inventory policies. Similar service innovations by privatized bus and rail transit companies would also benefit travelers. Possibilities include new non-stop express van and bus services, specialized scheduled and non-scheduled van services, and door-to-door services.[29] Private bus and rail companies might also find it profitable to offer premium higher fare service with seat and schedule guarantees. Transit service innovations could also generate improvements in land use, something rarely achieved by public transit (Pickrell (1999)).

These innovations go beyond what John R. Meyer characterizes as "transit's streetcar mentality"—scheduled stops by large buses or rail cars along a fixed route under all travel conditions. Transit operators, for example, might improve efficiency and service to travelers by providing looped express bus operations—turning some buses short instead of running all buses the full length of the route—and running minibus operations on the outer (lower density) parts of the route (see Kerin (1990)). Indeed, as I discuss later, intensive minibus operations have been a beneficial outcome of British bus privatization.

The deregulation experience has also shown that new market entrants, such as Southwest Airlines, often become the most efficient firms in a deregulated industry. In

[28] Indianapolis is one of the few U.S. cities that has privatized its transit system. Karlaftis and McCarthy (1999) estimate that although the system is producing more vehicle miles and passenger miles, its operating costs have declined 2.5 percent annually since privatization. These savings are primarily efficiency gains, not transfers from transit labor.

[29] See, for example, Volpe National Transportation Systems Center, *Autonomous Dial-a-Ride Transit*, U.S. Department of Transportation, Washington, D.C., November 1998.

the transit industry, privatization could lead to intense competition supplied by paratransit operations, such as jitneys, and other low-cost operations, such as minibuses. Competition among these new entrants and conventional bus, rail, taxi, and auto modes would insure that cost reductions would become fare reductions.[30]

Unlike airlines and trucks, railroads were deregulated because of their poor financial performance under regulation. It was expected that in pursuit of greater profitability the deregulated railroad industry would substantially reduce its operations, raise rates on much of its bulk freight, and cede a lot of manufactured freight to truck. Railroads have indeed pruned their systems, but they have also become more efficient and responsive to customers—offering lower (contract) rates and better service. Thus instead of losing market share, deregulated railroads are actually carrying more freight, regaining market share, and increasing their earnings. Depending on the behavior of new entrants and what is done with the established transit authorities, there are numerous possibilities for how a privatized transit industry would supply peak and off-peak service.[31] Nonetheless, the railroads' experience suggests that an efficient transformation of the transit industry's operations, technology, pricing, and service could increase transit use and relieve taxpayers of subsidizing transit's operations.

From a political perspective, deregulation succeeded because its benefits did not accrue to the rich at the expense of the poor. To be sure, some travelers and shippers benefited more than others, but the distribution of benefits generally had a rational economic basis. Public transit authorities have not aggressively pursued, let alone achieved, laudable social goals such as improving the urban mobility of the poor (Winston and Shirley (1998)). Thus a private system would not threaten to undermine any socially desirable income transfers. In fact, a private system may benefit low-income travelers because carriers would have the financial incentive and ability to develop a

[30] It would be desirable to deregulate taxis as part of a broader strategy to stimulate competition in urban transport. No longer enjoying a secure niche between the private car and the city bus or rail service, taxis would be forced, for example, to compete with vans that operate like taxis and offer links with rail and bus operations. The increased competition and coordination in the new urban transit system should lower taxi fares, improve service quality, and enable taxi operations to impose some competitive pressure on transit.

[31] One strategy transit companies might pursue is to set capacity for off-peak periods and rely on part-time labor to develop peak capacity with extra scheduling and looping. Competition from private jitneys and other services with scheduled bus operations could be gradually introduced following the property rights approach developed by Klein, Moore, and Reja (1997).

market for such customers. For example, Queens Van Plan, a private company, developed a highly valued and profitable service for low- to middle-income minority workers in New York's Queens and Nassau counties, who were largely neglected by public transit.[32]

Roads

Public highways are characterized by pricing and design inefficiencies, inflated labor costs and expenditures on new construction and repair, and wasteful projects. Public authorities' delays in adopting technological innovations that could substantially improve the speed and safety of highway travel may also emerge as a large social cost.

At this point, the appeal of highway privatization in U.S. cities and intercity stretches is conceptual. Empirical evidence on its potential effects is not yet available. Thus I believe it is premature to recommend privatizing U.S. highways, but it is worth thinking about how market forces could reduce highway inefficiencies.

Let's begin with pricing. The conventional criticism of current road pricing is that it does not account for congestion. I have presented estimates of the benefits of congestion pricing in the United States based on an average value of travelers' willingness to pay to save travel time. However, travelers differ—sometimes greatly—in how much they are willing to pay for transport capacity. For example, in airline travel some business travelers are willing to pay the large costs that airlines incur for making seats available to them when they travel at the last moment. At the other extreme, some pleasure travelers make an effort to get low fares by planning their trips far in advance and being flexible about which day of the week they can travel. Other air travelers have preferences and constraints that fall between these extremes, and their fares are set accordingly. Thus by offering a range of fares and associated travel restrictions, the deregulated airline industry has greatly improved the use of its aircraft capacity and benefited travelers.

Some highway commuters are willing to pay a great deal to get to work much faster on a particular day, while others are not willing to pay much to speed up their trip. Highway capacity could be used more efficiently if motorists were offered a range of

[32] Hector Ricketts, "Roadblocks Made Just for Vans," *New York Times*, November 22, 1997, p. A15.

prices and service levels (e.g., travelers could choose among high-priced lanes with little congestion and lower-priced lanes with more congestion.)

In fact, a few U.S. highways have made a start in this direction by introducing *value pricing*. An example is the high-occupancy-toll (HOT) lanes on Interstate 15 near San Diego, where solo drivers pay a toll to use less-congested carpool lanes. By varying over the day, the toll more accurately reflects the value the road provides over alternate routes. But as pointed out by Small (2000), second-best pricing distortions may arise in highway travel because one or a few lanes are tolled, but free alternate lanes and routes are close at hand. The efficient (first-best) policy would be to price all lanes (and alternate highways) in accordance with traffic conditions and travelers' willingness to pay to save travel time.

Could competition among highways develop and produce efficient tolls? New Zealand is considering a bold first step, called commercialization, where the government turns its roads over to commercial road companies, which would be expected to charge for their use and earn a return on capital while being regulated as public utilities. Such a policy would be problematic in the United States, where government regulation of public utilities is renowned for creating inefficiencies. Others have suggested that the U.S. government franchise highways to private companies, although the devil would still be in the operating and financial constraints that the government placed on franchised companies and whether competition could evolve given these constraints.

Intercity deregulation offers a potentially useful analogy for solving this problem. Deregulated carriers have had to compete against each other, and in a certain sense against consumer "organizations." For example, railroads set most of their rates through contract negotiations with shippers. Among other factors, rates are affected by a shipper's traffic volume and competitive options. Shippers can improve their bargaining position by increasing their traffic volume as part of a group of firms that negotiates rates and by playing off one railroad against potential sources of competition. Such sources include other railroads in the market, other railroads reasonably close to the shipper, plants that compete with the shipper's plant in the product market, alternative origins from which the receiver could use alternative railroads to receive a product, alternative modes such as truck and barge, and so on. By enhancing their bargaining power, shippers can fully

realize the benefits of rail freight competition. Similarly, the benefits of airline competition are enhanced when travelers negotiate as a group to get lower fares or encourage a new entrant to provide service when they are dissatisfied with incumbent carriers.

Could highway users help road competition develop by organizing as bargaining units that negotiate prices and service? Suppose the government distributes roads to commercial companies, as in commercialization, but aims to allocate potentially competitive intercity stretches (for example, California's Highway 101 and Interstate Route 5) and urban freeways and arterials to different companies. As in the railroad industry, a "contract equilibrium" could develop where private companies negotiate prices (long-term contracts) with private organizations representing motorists, truckers, railroads, private transit companies, and public sector transport. Public and private users *en masse* would therefore be able to bring competitive discipline on prices.

What would these prices look like? Customer groups would likely prefer a range of prices and levels of service. For example, Federal Express and other time-sensitive companies would want a lane (or even separate roads) to be available at a premium price. And time-sensitive automobile travelers would probably be willing to pay high tolls for travel on a less congested lane. It would take time for private road companies to explore various services that users were willing to pay for and for users' preferences to crystallize. But after that transition, the benefits could be large. Firms, and ultimately consumers, and households would gain from travel time savings. Out-of-pocket highway travel expenses would increase, especially for those who desire premium uncongested service, but price increases would be mitigated by and taxpayers, in general, would benefit from the lower cost of building, maintaining, and operating highways.

Profit-seeking private road companies would have strong incentives to shed the inefficiencies developed over decades in the public sector. Cost-cutting measures would include using axle-weight truck taxes to charge for pavement damage, building stronger pavements, placing much more control over construction and repair expenditures, reducing wages and managerial waste, and eliminating politically motivated projects.

Private road companies could improve the speed and safety of urban (and intercity) highway travel by implementing an intelligent transportation system (ITS).

Such a system could include centrally controlled traffic signals, electronic toll collection, message signs about traffic conditions, and traffic control centers that, as needed, dispatch emergency vehicles, adjust signal timing, and relay important road information to motorists. Under government management, the high-tech promises of this system could be compromised. One only has to think of the Federal Aviation Administration's management of air traffic control to understand how the U.S. government would raise the cost and slow the implementation of ITS.[33]

The possibility of turning U.S. roads over to private companies will seem less far-fetched as the inefficiencies caused by the public sector increase and become more widely known. The best way to implement this experiment and estimates of its economic effects await further research.[34]

The British Experience with Urban Transport Privatization

Urban transport in the United Kingdom suffers from many of the same economic problems. Prices for all modes fall short of efficient prices (Peirson and Vickerman (1998)), urban bus and rail transit require large subsidies, road congestion is severe, and transit and highway infrastructure is in poor condition but funds are not available to finance required investments. Unlike the United States, however, the United Kingdom has begun to address some of these problems by privatizing and deregulating part of its urban transport system.

The Transport Acts of 1980 and 1985 largely privatized and deregulated the bus industry in the United Kingdom, with the exception of London and Northern Ireland. Although buses operating within London were not deregulated, individual routes were put out for competitive tender. Under the 1985 Act, public or private bus companies could offer virtually any bus service they deemed profitable by giving local authorities 42 days (3 fortnights) notice. The 70 subsidiaries of the National Bus Company, a nationalized entity, were sold and the other publicly managed bus companies that had

[33] Air traffic control has been criticized for decades for cost overruns and delays in introducing new technology that would make air travel safer and faster. Most recently, it has been under the gun for failing to introduce Global Positioning System (GPS) technology that could enable air carriers to choose speedier flight paths and to takeoff and land more quickly.

[34] Privatization of roads could (and probably should) be introduced sequentially beginning with bridges and bottleneck thoroughfares and moving to entire highways.

dominated local bus service were reorganized as separate for-profit corporations. Many of these companies were subsequently sold to the private sector while those that remained public could no longer receive direct government subsidies. Local authorities could supplement commercial routes by subsidizing additional services that they felt were justified by social concerns, but these services had to be secured through competitive bidding.

The privatized U.K. bus industry has consolidated to a great extent and is currently dominated by large bus companies such as Stagecoach. Nonetheless, the economic effects of the Transport Acts have been broadly consistent with the predictions of bus privatization and deregulation in the United States (Winston and Shirley (1998)). White (1997) found that improvements in labor productivity, lower wages, and lower fuel and maintenance costs for minibuses—a major service innovation—reduced real bus operating costs. Kennedy (1995) found that competitive tendering for bus routes in London also lowered operating costs. As costs have fallen and fares have risen, the government has reduced bus subsidies from £237 million in 1985 to £117 million in 1998. Bus ridership has declined roughly a quarter, but in some areas of the country ridership has increased in response to intensive minibus operations.[35] Just three years after privatization, minibuses providing local service outside of London have grown from a few hundred to nearly 7,000 (Gomez-Ibanez and Meyer (1993)). Minibuses operate at higher average speeds and offer greater frequencies than conventional buses and their smaller sizes and maneuverability allow some operators to offer "hail and ride" service in which the minibus will stop at any point on the route to pick up and discharge passengers. White and others (1992) estimate that travelers have benefited substantially from minibus services that have expanded into suburban areas.

The United Kingdom has not privatized inner-city rail operations, but in March 1998, Deputy Prime Minister John Prescott announced that the London Transport Group (now London Underground Limited) will award three private-sector contracts to maintain and modernize the London Underground. Successful bidders will be responsible for track, signals, and stations, while trains will continue to operate within the public sector.

The reform is expected to reduce rail infrastructure costs and the Underground's annual subsidy (now some £100 million). The economic effects of this policy will also depend on the rental charges that the public authority must pay the private companies to use the renewed facilities.

The United Kingdom has taken no steps to privatize roads, but in 1999 the government published *Breaking the Logjam*, which proposed legislation to empower local authorities to "charge drivers for using particular roads or roads in a specified area, and to levy a charge on workplace parking." Although the object is to reduce congestion or traffic growth, Newbery and Santos (1999) point out that there has been little discussion of the principles that should guide these road charges. It appears that local authorities are primarily being encouraged to use them to help finance transport or land-use projects—a purpose that caused the California state legislature to cancel one of the few congestion pricing demonstration projects ever proposed in the United States.[36]

Budgetary pressures, rather than concern with allocative and technical inefficiencies created by the public sector, are motivating the United Kingdom's privatization efforts in urban bus operations and rail infrastructure. From a U.S. perspective, the U.K. experience is encouraging because it demonstrates that transit privatization and deregulation can reduce costs and spur innovative services such as minibuses.[37] On the other hand, the United States is not especially concerned with transit deficits, as indicated by the T21 legislation, which increases federal spending for transit (and highways). Thus it is not clear what will induce the United States to pursue privatization.

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[35] Bus ridership had been declining before privatization. In light of this trend, one must be careful about attributing all of the recent decline in ridership to privatization.

[36] The newly elected mayor of London, Ken Livingstone, has recently decided to charge motorists who wish to enter London's Inner Ring on weekdays between the hours of 7am and 7pm. A fee of £5 for cars is being seriously considered, fees would be higher for commercial vehicles. If this fee is charged, it is expected that traffic would fall 10 percent and that the average speed would rise from 9 to 11 miles-per hour.

[37] Gomez-Ibanez and Meyer (1993) support this conclusion based on the privatization experience in several countries including the United Kingdom.

Final Comments

Intercity deregulation in the United States became politically attractive in the 1970s when the political benefits to policymakers from working in harness with carriers and labor were overwhelmed by the potential political gains from reducing inflation. When policymakers were ready to act, academic research was available to guide their understanding of the likely effects of deregulation.

Similarly, the probability of privatizing urban transport in the United States will increase if the prospect of major political gain becomes clear. Unfortunately, it won't in the near future because recent successes in eliminating budget deficits at all governmental levels have eased pressure to cut wasteful spending on urban transportation. Nonetheless, researchers should continue to explore the effects of privatization and provide guidance for how cities can conduct privatization experiments. There is no escaping the evidence that the U.S. government's activity in this area is marked by failure. Research should be available when the promise of political gains beckons policymakers to acknowledge this failure.

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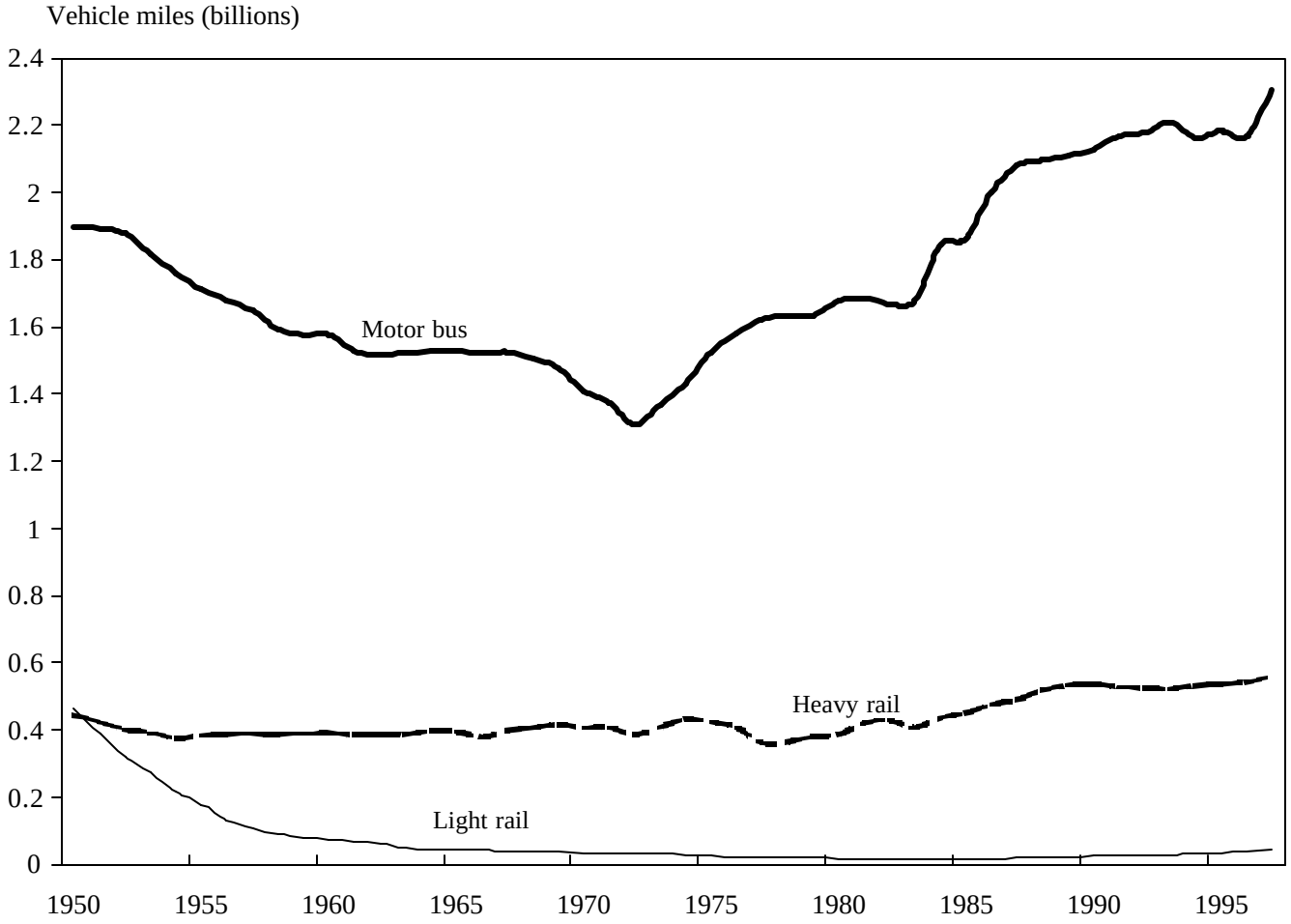
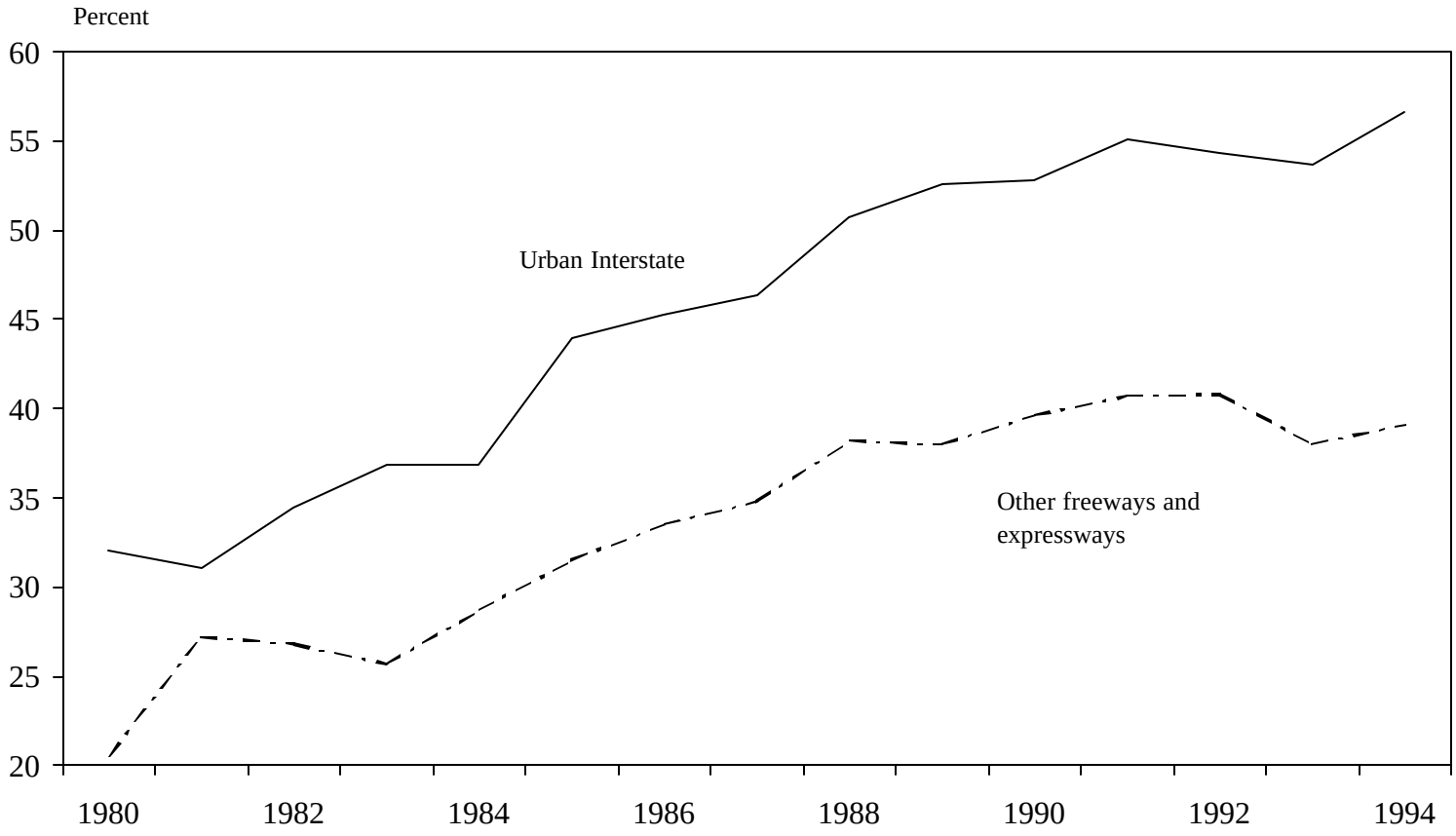
Figure 1. Heavy and Light Rail and Motor Bus Vehicle Miles, 1950-1997[a]



Sources: American Public Transit Association (APTA), 1997 Transit Fact Book (for 1984-95); 1991 Transit Fact Book (for 1975-83); 1974-75 Transit Fact Book (for 1960-73); 1981 Transit Fact Book (for 1974); and Transit Fact Book 1960(for 1950-59).

[a] A number of smaller and rural systems are excluded before 1984.

Figure 2. Urban Road Miles at Over 71 Percent Capacity in Peak Periods



Source: Federal Highway Administration, Highway Statistics (Department of Transportation, annual), table HM-61

Table 1

Journey to Work Passengers and Mode Shares in U.S. Urban Areas with Population Greater than 1 million, 1960-1990

Mode	1960	1970	1980	1990
Millions of Workers				
Privately Owned Vehicle	17.5	27.6	36.5	49.8
Bus	3.8	3.3	3.0	2.9
Subway/ Rail	2.3	2.2	2.0	2.3
Walk	3.0	2.7	2.1	2.2
Other	5.2	1.2	1.7	2.4
Percentage of Workers				
Privately Owned Vehicle	61.0	74.4	80.4	83.5
Bus	13.1	9.0	6.7	4.9
Subway/ Rail	8.0	5.9	4.5	3.8
Walk	10.4	7.4	4.7	3.8
Other	7.5	3.3	3.7	4.0

Source: Federal Highway Administration, *Journey-to-Work Trends in the United States and its Major Metropolitan Areas 1960-1990, 1993*, from Census data; Federal Highway Administration, Journey-to-Work Trends, based on 1960, 1970, and 1980 Decennial Censuses, 1986; and authors' calculations.

Note: The Other category in 1960 and 1970 Passenger Trips includes walking, taxi, motorcycle, bicycle, and respondents who work athome; The Other category in other years and in Mode Share includes these modes except walking; The Mode Share data for walking in 1960 and 1970 is based on U.S. data rather than major urban area data; The set of major urban areas with population exceeding one million changes by decade.

Table 2

Effects of Efficient Urban Transportation Pricing and Services in the U.S.

Billions of 1998 dollars

Assumption and Mode	Consumer Benefits	Government Balances	Net Benefits
Efficient Pricing Only			
Auto, Bus and Rail Total	-16.0	23.9	7.9
Auto toll	-8.2	12.0	3.8
Bus	-4.3	7.0	2.6
Rail	-2.4	2.8	0.4
Efficient Pricing and Transit Service Frequency			
Auto, Bus and Rail Total	-16.2	29.3	13.0
Bus	-4.3	11.7	7.3
Rail	-2.8	4.3	1.6

Source: Winston and Shirley (1998)